

WHAT IS CLAIMED IS:

1. An anti-slip step comprising:

(a.) a tread plate with a top surface and a bottom surface;

5 (b.) a plurality of grip structures extending upwardly from the top surface of the tread plate, each of said grip structures at least partially defining a hole extending through the tread plate and each of said grip structures comprising:

a base having a continuous, curved side wall that is joined to the tread plate; and

10 a plurality of spaced-apart tabs joined to the base and extending upwardly therefrom; and

(c.) a plurality of drain structures extending downwardly from the bottom surface of the tread plate, each of said drain structures at least partially defining a drain hole extending through the tread plate.

15 2. The anti-slip step of claim 1, wherein each drain structure comprises a plurality of spaced-apart tabs.

20 3. The anti-slip step of claim 2, wherein the tabs of the drain structures are joined to the tread plate.

4. The anti-slip step of claim 2, wherein the tabs of the drain structures each have a substantially angular shape.

25 5. The anti-slip step of claim 1, wherein the tabs of the grip structures each have a substantially angular shape.

30 6. The anti-slip step of claim 1, wherein the grip structures are arranged in at least two rows and the drain structures are arranged in at least one row, and wherein the at least one row of the drain structures is disposed between the at least two rows of the grip structures.

7. The anti-slip step of claim 6, wherein the at least one row of the drain structures and the at least two rows of the grip structures are all parallel to each other.

5

8. The anti-slip step of claim 1, wherein in each of the grip structures, the base has a plurality of top ends disposed between the tabs and the tabs have a plurality of top ends, and wherein the top ends of the tabs have substantially the same length as the top ends of the base.

10

9. The anti-slip step of claim 1, wherein in each of the grip structures, the base comprises a continuous side wall.

10. The anti-slip step of claim 9, wherein in each of the grip structures, the side wall of the base is frusto-conical.

15

11. The anti-slip step of claim 10, wherein the tread plate is composed of a metal.

20

12. An anti-slip step comprising:
(a.) a tread plate with a top surface and a bottom surface;
(b.) a plurality of grip structures extending upwardly from the top surface of the tread plate, each of said grip structures having a height (H) and at least partially defining a hole extending through the tread plate, each of said grip structures comprising:

25

a base having a continuous side wall joined to the tread plate so as to form a radius of curvature (RC) between the base and the top surface of the tread plate, wherein the ratio of the radius of curvature (RC) to the height (H) of the grip structure is greater than 0.5; and

30

a plurality of spaced-apart tabs joined to the base and extending upwardly therefrom.

13. The anti-slip step of claim 12, wherein in each of the grip structures, the side wall of the base is frusto-conical.

5 14. The anti-slip step of claim 13, wherein the tabs of the grip structures each have a substantially angular shape.

15 15. The anti-slip step of claim 12, wherein the holes of the tread plate each have a diameter (D), and wherein in each of the grip structures, the ratio of the height (H) of the grip structure to the diameter (D) of the hole is less than 0.75.

16 16. The anti-slip step of claim 15, wherein in each of the grip structures, the ratio of the height (H) of the grip structure to the diameter (D) of the hole is less than 0.5.

17 17. The anti-slip step of claim 12, wherein in each of the grip structures, the base has a plurality of top ends disposed between the tabs and the tabs have a plurality of top ends, and wherein the top ends of the tabs have substantially the same length as the top ends of the base.

18. A method of forming an anti-slip step, said method comprising the steps of:

- 25 (a.) providing a tread plate having top and bottom surfaces;
(b.) forming a plurality of holes in the tread plate;
(c.) for at least one of the holes, bending a boundary region of the tread plate disposed around the hole so as to extend out of the plane of the tread plate and thereby form a first structure at least partially defining a first opening; and
(d.) for at least another one of the holes, bending a boundary region
30 disposed around the hole so as to extend out of the plane of the tread plate and thereby form a second structure at least partially defining a second opening,

wherein the second structure extends a farther distance from the tread plate than the first structure.

19. The method of claim 18, wherein step (c.) is performed such that the
5 first structure extends downwardly from the bottom surface of the tread plate, and wherein step (d.) is performed such that the second structure extends upwardly from the top surface of the tread plate.

20. The method of claim 19, wherein step (c.) is performed such that the
10 first structure comprises a plurality of spaced-apart tabs joined to the tread plate, and wherein step (d.) is performed such that the second structure comprises a base having a continuous, curved side wall that is joined to the metal plate and a plurality of spaced-apart tabs joined to the base and extending upwardly therefrom.

15 21. The method of claim 18, wherein steps (c.) and (d.) are performed so as to form a plurality of first structures and a plurality of second structures, and wherein the second structures are arranged in at least two rows and the first structures are arranged in at least one row, and wherein the at least one row of
20 the first structures is disposed between the at least two rows of the second structures.

22. The method of claim 21, wherein step (c.) is performed such that each
25 of the first structures comprises a plurality of spaced-apart tabs joined to the tread plate, and wherein step (d.) is performed such that each of the second structures comprises a base having a continuous, curved side wall that is joined to the metal plate and a plurality of spaced-apart tabs joined to the base and extending upwardly therefrom.

30